

(12) **UK Patent Application** (19) **GB** (11) **2 398 078** (13) **A**

(43) Date of A Publication **11.08.2004**

(21) Application No: **0326305.0**

(22) Date of Filing: **12.11.2003**

(30) Priority Data:
(31) **0227207** (32) **21.11.2002** (33) **GB**

(71) Applicant(s):
Liquid Science Laboratories Ltd
(Incorporated in the United Kingdom)
Unit R, Bee Mill, Ribchester, PRESTON,
Lancashire, PR3 3XJ, United Kingdom

(72) Inventor(s):
David McCartney

(74) Agent and/or Address for Service:
David L McNeight
Brow Top, Lees Lane, WILMSLOW,
Cheshire, SK9 2LR, United Kingdom

(51) INT CL⁷:
C11D 17/00

(52) UK CL (Edition W):
C5D DAB D120 D121 D124 D135 D141 D166 D182

(56) Documents Cited:
GB 2167083 A **US 4264479 A**

(58) Field of Search:
UK CL (Edition W) **C5D**
INT CL⁷ **C11D**
Other:

(54) Abstract Title: **Solvent**

(57) A solvent, effective for cleaning paintbrushes, and for cleaning off inks and markers, comprises a solution in water of a non-caustic alkali, a blend of ionic and non-ionic surfactants and a blend of water compatible organic solvents.

The alkali may be an alkanolamine. The ionic surfactant may be a betaine. The nonionic surfactant may be an alkoxyated alcohol. The solvents may be a mixture of terpene and glycol ether.

BEST AVAILABLE COPY

GB 2 398 078 A

Solvent

This invention relates to solvents, particularly, though not exclusively, for use as paint and paintbrush cleaners, and for cleaning off inks and markers.

Conventional products, such as turpentine substitute and some grades of white spirit, are found to be carcinogenic and/or harmful in other ways, and a safe alternative is required. The present invention provides such an alternative.

The invention comprises a solvent comprising a solution in water of a non-caustic alkali, a blend of ionic and non-ionic surfactants and a blend of water compatible organic solvents.

In one formulation according to the invention, the solvent comprises a solution in water of:

- an alkanolamide
- a sodium salt of an organic chelate
- a non-ionic surfactant
- an amphoteric surfactant
- a terpenol solvent, and
- a glycol ether solvent.

The alkanolamide may be triethanolamide.

The sodium salt may be that of trinitriloacetic acid.

The non-ionic surfactant may be fatty alcohol ethoxylate.

The amphoteric surfactant may be Laurylbetaine.

The terpenol solvent may be D-Limonene.

The glycol ether solvent may be 1-methoxy-2 propanol.

A colorant may be added.

The invention also comprises a method of making a solvent, comprising forming a solution in water of a non-caustic alkali, a blend of ionic and non-ionic surfactants and a blend of water compatible organic solvents.

The solution may be formed at ambient temperature. The product may be stirred to achieve dispersion.

In one method for making a solvent according to the invention, the non-caustic alkali, the surfactants and the organic solvents are added to water in that order.

One example of a solvent and a method for making it according to the invention will now be described.

Formulation:

Water	77.53 (84.29)
Triethanolamide	2.38
Trinitriloacetic acid - Sodium salt (40%)	5.71 (2.28)
Fatty alcohol ethoxylate (6 mole ethoxylate)	4.76
Laurylbetaine (30%)	4.76 (1.43)
D-Limonene (citrus terpene)	2.36

1-methoxy-2-propanol	2.36
Yellow dye	0.10

Figures are % by volume. The sodium salt and the Laurylbetaine are supplied as solutions in water, the active content indicated in brackets. The bracketed water content takes account of this.

This formulation is balanced with citric acid to a pH in the range 9.0 to 9.5.

The product is cold blended at ambient temperature in a stainless steel tank, dispersion being achieved by stirring with a motor driven mixer blade. The materials are added in the order given in the Formulation - this avoids excess froth at an early stage of the process and ensures solubility of the terpenol solvent. After all ingredients are added, the product is mixed for 20 minutes.

It is possible to concentrate the formulation to achieve an active content in the region of 20%, but lesser concentrations are preferred to avoid stability problems in hot or cold storage. It is anticipated that the product will be diluted in use. It will be effective at a dilution of one part to twenty parts water, but for some paints, one part to ten parts water would be recommended.

Various substitutions can be made for the components given in the Formulation. Thus, the sodium salt may be that of ethylene diamide tetraacetic acid. Any of a wide range of non-ionic solvents could be used, for example nonylphenol ethoxylate (8 mole ethoxylated). Sodium xylene sulphonate could be used as the non-ionic surfactant. Other terpinol solvents could be used, such as pine turpinol and synthetic turpene DAB 45. Any of a wide range of glycol ether solvents could be used, including 2-butoxy ethanol (butyl glycol) and dipropylene glycol mono methyl ether (Solvent DPM).

The solvent is effective for the removal and of a wide range of solvent and water based paints, printing inks and markers and cleaning brushes, rollers and other equipment. Within the scope of the invention, solvents can be designed that will be particularly effective against certain types of paint, ink and marker products, but these may be less effective against others.

Claims:

1 A solvent comprising a solution in water of a non-caustic alkali, a blend of ionic and non-ionic surfactants and a blend of water compatible organic solvents.

2 A solvent comprising a solution in water of:

- an alkanolamide
- a sodium salt of an organic chelate
- a non-ionic surfactant
- an amphoteric surfactant
- a terpenol solvent, and
- a glycol ether solvent.

3 A solvent according to claim 2, in which the alkanolamide is triethanolamide.

4 A solvent according to claim 2 or claim 3, in which the sodium salt is that of trinitriloacetic acid.

5 A solvent according to any one of claims 2 to 4, in which the non-ionic surfactant is fatty acid ethoxylate.

6 A solvent according to any one of claims 2 to 5, in which the amphoteric surfactant is Laurylbetaine.

7 A solvent according to any one of claims 2 to 6, in which the terpenol; solvent is D-Limonene.

8 A solvent according to any one of claims 2 to 7, in which the glycol-ether solvent is 1-methoxy-2-propanol.

9 A solvent according to any one of claims 1 to 8, containing a colorant.

10 A method for making a solvent, comprising forming a solution in water of a non-caustic alkali, a blend of ionic and non-ionic surfactants and a blend of water compatible organic solvents.

11 A method according to claim 10, in which the solution is formed at ambient temperature.

12 A method according to claim 10 or claim 11, in which the product is stirred to achieve dispersion.

13 A method according to any one of claims 10 to 12, in which the non-caustic alkali, the surfactants and the organic solvents are added to water in that order.

14 A solvent made by a method according to any one of claims 10 to 13.

15 A solvent substantially as hereinbefore set forth with reference to the Formulation and the permitted substitutions.

Amendments to the claims have been filed as follows

- 1 A solvent comprising a solution in water of:
 - an alkanolamide
 - a sodium salt of an organic chelate
 - a non-ionic surfactant
 - an amphoteric surfactant
 - a terpenol solvent, and
 - a glycol ether solvent.
- 2 A solvent according to claim 2, in which the alkanolamide is triethanolamide.
- 3 A solvent according to claim 2 or claim 3, in which the sodium salt is that of trinitriloacetic acid.
- 4 A solvent according to any one of claims 2 to 4, in which the non-ionic surfactant is a fatty alcohol ethoxylate.
- 5 A solvent according to any one of claims 2 to 5, in which the amphoteric surfactant is Laurylbetaine.
- 6 A solvent according to any one of claims 2 to 6, in which the terpenol; solvent is D-Limonene.
- 7 A solvent according to any one of claims 2 to 7, in which the glycol-ether solvent is 1-methoxy-2-propanol.

- 8 A solvent according to any one of claims 1 to 8, containing a colorant.
- 9 A method for making a solvent, comprising forming a solution in water of.
- an alkanolamide
 - a sodium salt of an organic chelate
 - a non-ionic surfactant
 - an amphoteric surfactant
 - a terpenol solvent, and
 - a glycol ether solvent.
- 10 A method according to claim 10, in which the solution is formed at ambient temperature.
- 11 A method according to claim 10 or claim 11, in which the product is stirred to achieve dispersion.
- 12 A method according to any one of claims 10 to 12, in which the non-caustic alkali, the surfactants and the organic solvents are added to water in that order.
- 13 A solvent made by a method according to any one of claims 10 to 13.
- 14 A solvent substantially as hereinbefore set forth with reference to the Formulation and the permitted substitutions.



INVESTOR IN PEOPLE

Application No: GB0326305.0

Examiner: Mike Conlon

Claims searched: 1-15

Date of search: 24 May 2004

Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular reference
X	1, 10-14	GB2167083 A PROCTER & GAMBLE Example 1 and page 3 lines 59-65
X	1, 10-14	US4264479 A FLANAGAN Example XII

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^W :

C5D

Worldwide search of patent documents classified in the following areas of the IPC⁰⁷

C11D

The following online and other databases have been used in the preparation of this search report

Online: WPI EPODOC JAPIO

**This Page is Inserted by IFW Indexing and Scanning
Operations and is not part of the Official Record**

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☐ BLACK BORDERS
- ☐ IMAGE CUT OFF AT TOP, BOTTOM OR SIDES
- ☒ FADED TEXT OR DRAWING
- ☒ BLURRED OR ILLEGIBLE TEXT OR DRAWING
- ☐ SKEWED/SLANTED IMAGES
- ☐ COLOR OR BLACK AND WHITE PHOTOGRAPHS
- ☐ GRAY SCALE DOCUMENTS
- ☐ LINES OR MARKS ON ORIGINAL DOCUMENT
- ☒ REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY
- ☐ OTHER: _____

IMAGES ARE BEST AVAILABLE COPY.

As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.